

NEW SERIES

OCTOBER, 1910

NUMBER 14

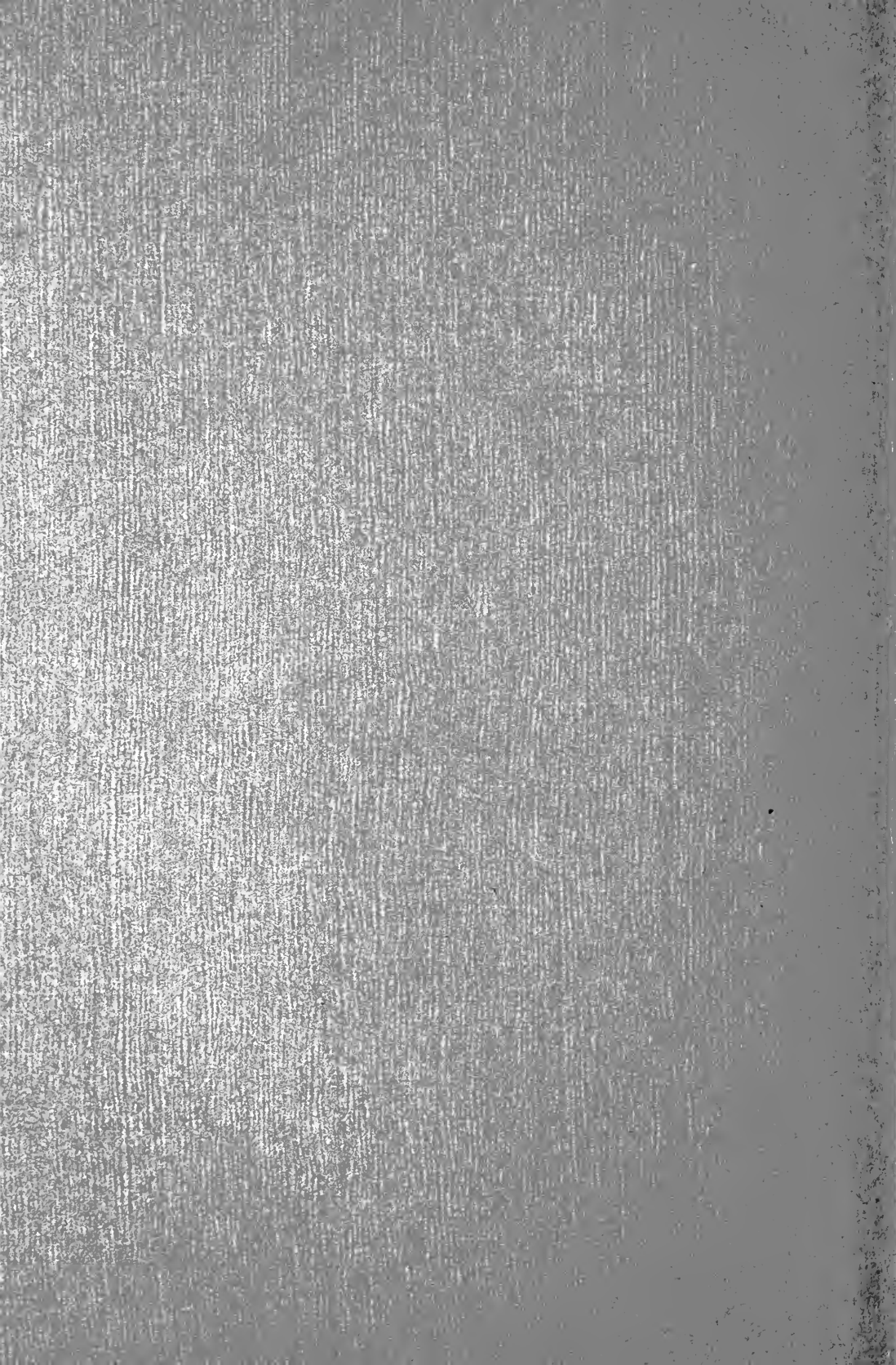
Alabama Girls Industrial School Bulletin

Domestic Art

Published Quarterly by

Alabama Girls Industrial School
Montevallo, Alabama

Entered as second-class mail matter



BULLETIN
OF THE
ALABAMA
GIRLS INDUSTRIAL
SCHOOL

Domestic Art
First and Second Year High School

BY
MERLE MARIE STEPHENS

The Dispatch Ptg Co., Birmingham, Ala.

CONTENTS.

Aim Sought to be Accomplished	4
Course, Outline of	8
Elective	12
Textile Fibers and Processes	14

Foreword.

This bulletin is prepared in the hope that high schools in our State may be induced to offer similar courses of instruction. This particular form of handwork is one which offers an ideal combination, native interest of the pupil and maximum amount of thought power. The subject demands accurate thinking; it trains a student in habits of neatness, hygienic principles, and an appreciation of color, good lines, and good proportions. That all the subjects connected with the study of Domestic Art have a strong influence in developing the whole mind we firmly believe.

Montevallo, January 22, 1911.

Aims in the Teaching of Domestic Art.

The field covered by Domestic Art is so broad that it is difficult to state all its aims. The following have been prominent in making the course herein described:

1. To make art principles the fundamental basis for all construction work.
2. To relate school life with the life of the home.
3. To allow as great freedom of development as is consistent with intelligent work. Not to teach accuracy at the expense of judgment.
4. To make an introduction to the ethical side of the textile world by a study of the fibers and processes of manufacture as affecting the shopper of today.

DISCUSSION.

1. In 1904 a Commission was sent from Prussia to study educational conditions in the United States, with reference to technical instruction and industrial development. In extracts of their reports published in Bulletin No. 2 by The Bureau of Education, there is commendation of our methods of teaching drawing in the elementary schools, but they express great astonishment at finding the evidences of the influence of this drawing so slight in the work of the industrial schools, the high schools, and the American home. "The results of the instruction in the lower grades exceed all expectations. In the advanced grades they do not wholly accord with this auspicious beginning. While the work of the children of eight or nine years is so admirable, the pupils of fifteen or sixteen often offer correspondingly little that is satisfactory." While the above criticism may have been just in 1906, we hope it will be impossible in 1916.

The question is sometimes asked us when will all this Domestic Art teaching free us from the slavery of fashion. One answer may be, "Only when physical education and art instruction have so combined forces as to make the individual acknowledge for herself the absurdity of deforming her body and then clothing it in garments showing poor lines, bad proportions, and impossible colors."

Art instruction aims to raise the standard of taste. It includes instruction in seeing and interpreting the beautiful in nature and the arts, in drawing, in designing, coloring, and modeling, in manipulating paper, cloth, leather, wood, metal, and material to produce a result having elements of beauty.

"In 1870 the product of Massachusetts in printed cottons was over seventeen millions of dollars and her product of other goods into which the arts of design enter as a matter of first importance was doubtless even more. Massachusetts is thoughtful, as ever. She sees that other States are overtaking her in manufactures so far as quantity and quality of material are concerned, but she determines to distance them by spreading throughout her borders knowledge of the principles of beauty in design and skill in them. And she never did a wiser thing. It will tell on a multitude of industries. Why do we import such vast quantities of English, German, and Danish glassware and pottery? Because they are better in material than ours? No, but because they have a beauty in design which leads the most illiterate to choose them. Why do we import such quantities of silks and carpets and chintzes and wall-papers from France? The Cheneys make silks as good in quality on this side of the ocean as the Compagnie Lyonnaise make on the other; the Bigelows make carpets just as good in material here as the D'Aubusson factory makes there; and yet when our wives and daughters see these foreign fabrics, they immediately prefer them. Why? Simply because there generally are in the foreign product a skill, a beauty, a taste in design, that appeal to that sense of beauty which God has implanted in the rudest of our race."

"Other nations in this warfare of industry see this. England is devoting millions to art education, in order to keep up her manufactures, and has established in the privy council a science and art section to direct this expenditure wisely; Germany is doing even more; France has been doing it for generations, and it has given her the supremacy thus far in a multitude of branches of manufacture."

If you wish to see how these nations have done and are doing this, look at Mr. Stetson's admirable little book on Technical Education. You will there see that Prussia alone gives industrial education in various branches to over 11,000 men.

Already the value of this is known to individuals among us. Mr. Stebbins tells us that one silverware establishment in the city of New York pays a graduate of one of these foreign schools for making designs and patterns a salary as high as the Empire State gives its Governor.

Practical industrial drawing may be said to have two departments. First, mechanical or instrumental drawing; secondly, free-hand drawing and design; and by means of these two the constructive industry of the world is carried on.

2. With few exceptions, every girl who enters the high school has an interest in the home subjects of Sewing and Cooking. That interest can be used to form habits of neatness, accuracy and personal responsibility.

Each individual girl can be made to feel her own responsibility for her health and her personal appearance. The possibilities are that she has already formed habits in both eating and dressing which are inimical to health. Elementary science and art can teach her the impossibility of continuing such habits and reaching even a medium standard of mental development. Seven-eighths of the time lost from school because of sickness is due to ignorance of the hygienic laws of food and clothing.

3. It is a sad fact that the average student comes to us feeling that it does not matter how a garment is put together, what kind of a seam she makes or why; her only object being to get to the end and say "finished." It is a tedious process to teach her there is a right way and she must do the right way purely because it is right and nothing else will be accepted from her. Sometimes this will seem to crush independent thinking, but this difficulty can be remedied after the pupil has some foundation for independent work. Our second year offers many opportunities for such work, but it is impossible to do so in the first year because we can base nothing on the previous training of the pupil.

It may be that the pupil will never make a garment after she leaves school, but her training should have made clear to her the duty of rendering adequate compensation to the one who makes the garment for her. She will then have a right to demand excellent work. There is nothing more deplorable in the ethical world of woman today than her demand for excellent work and her corresponding unwillingness to pay for it, which is based upon her unwillingness and inability to do the work herself, and her ignorance of its value.

4. The subject of textiles is a difficult one to handle at the present time because a text book which just suits the purpose is not to be had, but much can be done with what we have and supplementary reading.

In a study of the problems of industrialism labor and capital have absorbed so large a share of attention that the consumer has been

neglected. Woman is largely a consumer, responsible for the wise expenditure of the family income. May not Domestic Art add its strongest efforts toward bettering home conditions by helping to make a wise consumer of the high school girl?

A knowledge of how raw materials are converted into textile products is necessary for an intelligent understanding of the great problems of today; child labor, sweat shop labor, home economics, industrial betterment, and social ethics. It means something for a woman to know that when she purchases a ready made garment for less money than the textile material would cost her she is encouraging the sweat shop system and child labor.

On its economic side, Mrs. Richards, in "The Cost of Living," has this to say:

"This acquaintance with the nature of materials, combined with a knowledge of those lines and colors that are becoming to her, should prove an effective antidote to the present tendency on the part of manufacturers to cheapen the quality of the goods which they produce. When one realizes that the world's total production of wool in any one year is equal to meet only one-third the demand, it is not difficult to see that some substitute must be added to cater to the call of those who frantically pursue a fashion which is constantly changing with kaleidoscopic rapidity and alternations of form. But if we can come to realize that certain lines, and colors of more or less limited range, are becoming to us, those and those alone, if to that realization we add such a knowledge of the nature and manufacture of fibres as to enable us to gauge the quality of a piece of dress goods, we shall buy only such material as will, by the excellence of its structure and coloring, conform to the demands we make on it. Under those conditions we shall be able to afford better materials than we can buy now; for when once we have a dress which exactly suits us we shall be less hasty in discarding it; we shall be able to employ a better dressmaker, also, and our costume will express far more of our personality and ideals than is possible now for the woman of limited income.

This knowledge of fibres is of such importance to a woman that some source of information ought to be furnished her. If the high school, in addition to its usual courses in home economics, offered such a course, including examination of the various fibres under the microscope, and chemical tests of the different dye stuffs, it would be of the greatest practical value."

OUTLINE OF COURSE OF STUDY IN DOMESTIC ART FOR
FIRST TWO YEARS OF THE HIGH SCHOOL.

FIRST YEAR.

Time—One and one-half hours, five periods a week.

Art two, Sewing three.

Art work as follows—

1. Drawing from nature and still life.
2. Medium used, pencil, charcoal, water color, pen and ink.
3. Designs for textiles and articles of decoration in the home.
4. Working out these designs in stenciling, clay modelling or basketry.

Sewing.

The sewing teacher will have to begin her high school work on the supposition that the subject is absolutely new to the fifteen-year-old student. Primary stitches will have to be taught and the quickest method is by a limited use of small models. Our first term work includes:

1. Primary stitches on samplers.
2. Hand made apron so as to make immediate application of stitches learned and to present simplest problems in garment structure.
3. A machine made undergarment, using a bought pattern. Object being to have pupils become familiar with *use* and *care* of machine, placing of pattern to economize material, method of constructing and finishing garment.

Second Term.

1. Method of taking accurate measures. Drafting of apron and sleeve pattern.
2. Making of work apron with long sleeves.
3. Drafting of five gore skirt pattern. Making of underskirt.
4. Drafting of shirt waist pattern and seven or nine gore skirt.
5. Making of a plain tailored shirt waist suit.
6. Stockinet darning. Cloth darning. Overhand and hemmed patch.

Careful notes are given for each lesson, each draft after being worked out with the class, is transferred by the pupil to her note book, using one-eighth or one-quarter inch scale of measurements.

A written examination is given at the end of the first term, which is averaged with the class work of the pupil for the terms grading.

At the end of the second term a written examination and a garment is required. The pupil is allowed to select any one of the garments made during the year and make another like it without the aid of the class teacher.

The following is a copy of test questions given freshman class for the two terms of 1909-1910:

First Year—Domestic Art.

Tuesday, December 15, 1909—9:00 A. M.

1. (a) Name the two machines you have learned to use this year and state three differences. (b) Define automatic.
2. Name parts of machine, (a) above stand; (b) below stand.
3. Make list of stitches used during work of this term. State where each was used.
4. State two methods of finishing raw edges.
5. Describe two methods of putting in a hem. Give example of each.
6. Give method of fastening thread without use of a knot. When may a knot be used?
7. State difference between darning and patching. (b) Name and illustrate different kinds of darning.
8. Name and illustrate the steps in making a button hole.
9. Describe and draw the patterns you have made.
10. (a) Give method of cutting and fitting a corset cover.
(b) State methods of finishing top.
(c) Describe method of putting on lace.

SECOND YEAR.

Time—One and one-half hours, five periods a week.

Art two, Sewing three.

Art work is a continuation of that of freshman year, with more advanced work in design and its application. Some problems in elementary bookmaking, drawing from life and composition work.

SEWING.

First Term.

1. Twenty lessons on textiles, beginning with primitive process of spinning and weaving. Pupils are impressed with the physical characteristics of different fibres, why some are more valuable as clothing, effects of some adulterants, modern processes of manufacture and some true principals of economy.

2. A review of skirt drafts done in the freshman year.

3. The making of a tailored wool skirt.

Second Term.

1. Making of a princess slip pattern by combining a tight waist pattern and one of the skirt patterns done the first term.

2. Making a princess slip as a review of undergarment construction done the first year.

3. Review of shirt waist draft. Selection or designing of style waist desired and changing shirt waist pattern to suit. Making of a silk waist by pattern made.

4. Making of a thin dress. Pupils are allowed to order a pattern according to their own measures.

Note books are kept throughout the year, and pupils encouraged to work independently rather than ask unnecessary questions.

The following is a list of examination questions given in 1909 and 1910. The work in textiles has been put in the first term and the problem of the silk shirt waist transferred to the second term:

DOMESTIC ART.

Second Year.

December 15, 1909.

1. (a) Give measurements required for drafting a shirt waist suit. (b) Tell how these measurements are to be taken.

2. Using your own measurements, draft a seven gored skirt to one-eighth inch scale.

3. Describe completely method of cutting a skirt. Give the name of material you used, its width, price and number of yards.

4. Write directions for painting a scale containing green; two tints of green, and two shades of green.

5. Imagine that you are standing in the middle of a straight street. Draw the street.

January 28, 1909.

Domestic Art.

SECOND YEAR.

May 10, 1910.

1. Give average measurement for skirt draft and draft pattern for five gore skirt to one-eighth inch scale.

2. (a) Describe making of button hole. (b) Illustrate each step by a drawing.

3. Give your own measurements for a shirt waist and draft shirt waist pattern to one-quarter inch scale.

4. Describe method of putting wool skirt on belt so that skirt will fit smoothly around waist.

5. Describe method of hemming cotton skirt.

6. Draft shirt waist sleeve to one-quarter inch scale, using your own measurements.

7. (a) What textile should always be shrunk before being used?

(b) Give method of shrinking.

8. (a) Give rule for placing sleeves. (b) How should arm-size seam be finished?

9. (a) Give different methods of finishing seams on wool skirt.

(b) Describe how each is done.

10. (a) Name the different textile materials you have used in your sewing this year. (b) State some facts in the process of manufacture which you know are detrimental to the wearing quality of the material. (c) Is it economy to buy cheap materials? Why? (d) What effect does the making and the wearing of a poorly made garment have on ones character?

ELECTIVES.

If high school girls are intelligent enough to make a choice of the kind of high school they wish to attend, why not keep them all in the same high school and offer a choice of academic courses in connection with certain technical subjects? The girl preparing for a college course based upon her study of the classics in the high school needs an acquaintance with health principle and a wise economy of her energies which could be given her by courses in Domestic Art and Domestic Science. Of course this would mean that the daily session would have to be extended, perhaps to four or five in the afternoon, but the students would have opportunity for study during school hours.

We allow students entering to elect one of the following courses requiring that they take Domestic Art or Music:

FRESHMAN CLASS.

Academic Subjects.

<i>English</i>		<i>Scientific</i>		<i>Classical</i>	
English.....	5	English.....	5	English.....	5
Mathematics.....	5	Mathematics.....	5	Mathematics.....	5
History.....	5	Physiology.....	3	Physiology.....	3
Physiology.....	3	Botany.....	2	Botany.....	2
Botany.....	2	Latin or French.....	5	Latin or French.....	5

Technical Subjects (For all Courses).

Minor—Sight Singing.....	2
Major—One of the following: Domestic Art or Music.....	10

SOPHOMORE CLASS.

Academic Subjects.

<i>English</i>		<i>Scientific</i>		<i>Classical</i>	
English.....	5	English.....	5	English.....	5
Mathematics.....	5	Mathematics.....	5	Mathematics.....	5
Horticulture.....	3	Horticulture.....	3	History.....	5
Zoology.....	2	Zoology.....	2	Latin.....	5
History.....	5	Latin or French.....	5		

Technical Subjects (For all Courses).

Minor—Sight Singing or Domestic Science.....	2
Major—One of the following: Domestic Art or Music.....	10

JUNIOR CLASS.

<i>English</i>		<i>Scientific</i>		<i>Classical</i>	
English.....	5	English.....	5	English.....	5
Mathematics.....	5	Mathematics.....	5	Mathematics.....	5
Physics.....	3	Physiography.....	2	Physics.....	3
Physiography.....	2	Physics.....	3	History.....	3
History.....	3	History.....	3	Latin.....	4
Ethics.....	2	Ethics.....	2		

SENIOR CLASS.

Academic Subjects.

<i>English</i>		<i>Scientific</i>		<i>Classical</i>	
English.....	5	English.....	5	English.....	5
Mathematics.....	5	Mathematics.....	5	Mathematics.....	5
History.....	2	History.....	2	Latin.....	5
Chemistry.....	5	Chemistry.....	5	History.....	2
Psychology.....	3	Psychology.....	3	Psychology.....	3

Major technical courses of ten hours a week are offered to Juniors and Seniors in the following:

Art, Bookkeeping, Education, Home Economics, Music, Telegraphy and Typewriting, Stenography and Typewriting.

Each student is required to select one of these.

Minor courses of one and one-half hours per week are offered to Juniors and Seniors in the following:

Bookkeeping, Cooking, Drawing, Physical Culture, Sewing, Sight Singing.

Each student is required to select one of these.

Textile Fibers and Processes.

SPINNING.

The earliest arts of which we have any knowledge are spinning and weaving. The need of securing things, or strengthening them led to binding, fastening and sewing. Fibers, hairs, grasses and sinews were twisted between the thumb and fingers, the palms of the hands, or the palms and thigh to strengthen them for these purposes and this activity is the foundation of the spinning wheel and the modern steam driven cotton spindle.

Spinning and weaving began long before we find any historical mention made of them and they were distinctively woman's employment.

The most primitive type of spinning is where no spindle is used, the fiber after being twisted is wound on a stone. The next step in advance is where we find a stick ten to twelve inches long with a slit cut in one end, being used to wind the thread on, also to help twist it. It is probable that the ease with which a full spindle would rotate or twist led to the whorl being added. The whorl is a round piece of stone, wood, clay or metal fastened to the bottom of the spindle.

The distaff is a stick or wooden fork, one end of which is held in hand, under the arm, or thrust into the belt the other end holds the raw material to be spun.

This method of spinning satisfied the demands of civilization as late as the Fifteenth Century. Early European spinning wheels show the distaff placed in the end of the wheel bench, leaving both hands free to manage the spindle and to draw out of the fibers.

The wool wheel was made to rotate by hand. Its motion was intermittent. The flax wheel was rotated by means of a treadle which made continuous motion possible.

These wheels were used for spinning wool, flax and cotton until Hargreave's invention of 1767.

WEAVING.

Weaving is mat making and basketry developed into an art, using thread made by spinning instead of coarse grasses and fibers. The problems to be solved in the beginning were the stretching of one set of threads tight while cross threads were put in and pushed close to-

gether or battened up. It is supposed that the warp threads were stretched between convenient objects on the ground while the filling threads or woof threads were woven back and forth as we do in darning today. One of the first improvements was an implement which would raise alternate warp threads forming a shed so that the filling threads could be put in more quickly. This device was called a heddle. There were many forms of heddles, one was a slotted frame with eyes in the slats. Alternate threads passed through the eyes and slots. By raising or lowering the heddle frame the shed was formed for the filling thread to be thrown back and forth. The filling thread was wound on a stick until a bobbin and shuttle were thought out.

The comb and batten were primitive implements for keeping the filling threads even and forcing them together tightly. Later the reed took the place of both these.

A loom may be defined as a machine which accomplishes three necessary movements:

1. Lifting of alternate warp threads to form shed.
2. Throwing back and forth of shuttle containing filling threads.
3. Crowding of weft threads into place. This may be done by the batten, comb or reed.

The colonial loom had treadles for raising and lowering the heddles, a warp beam and a cloth beam so that two additional motions were accomplished, that of winding up the cloth and unwinding the warp.

"No textiles of primitive people were ever woven in 'pieces' or 'bolts' of yards and yards in length, to be cut into garments. The cloth was made of the size and shape to suit the particular purpose for which it was designed. The mat, robe, or blanket had tribal outlines and proportions and was made according to the material and the use of common forms that prevailed among the tribes. The designs were always conventional and sometimes monotonous. The first beauty of the savage woman was uniformity which belonged to the texture and shape of the product."

The industries of spinning and weaving were taken out of the home and the modern factory system made possible when water or steam was made to do the work of the individual.

Sir Richard Arkwright is the father of the modern factory system. All machinery for spinning and weaving has been invented and perfected since 1750. Six men of genius—five Englishmen and one Ameri-

can—made cotton one of the world's greatest fibers. These were John Kay, James Hargreaves, Richard Arkwright, Samuel Crompton, Edmund Cartwright and Eli Whitney.

COTTON.

History. To find the first use of cotton by our race, we shall have to go back to a time five centuries before Christ. Herodotus tells us in 550 B. C. that there were trees in India "the fruit of which is a wool exceeding in beauty and goodness that of a sheep."

The Chinese put it in their gardens and sang of it in their poems, treating it as a rare and beautiful plant as late as the Sixth Century after Christ.

We have evidence of its limited use by the ancient Egyptians. It was introduced into Europe by the Moors, but it found no favor with the Spanish Christians until the Fourteenth Century.

In the New World cotton has been used from the dateless past. Pizarro found it in Peru; Cortez in Mexico; Columbus in West Indies. Indeed cotton in its wild or cultivated state was known everywhere between parallels of 40° north latitude and 40° south latitude at the date of the settlement of America. The present cotton belt of the United States excepted.

Three-fourth of the world's supply of cotton comes from the United States. India, Egypt, Russia and Brazil producing the remaining one-fourth.

Cultivation. It requires six months of the twelve to produce cotton. The seeds are planted in March or April, begin to blossom in June, the bolls mature and fiber is ready for picking from the latter part of August until frost comes.

Varieties. This depends upon the length of the staple; Sea Island, or long staple cotton varies from one and one-quarter inch to one and five-eighth inch, upland, or short staple three-quarters to one and one-eighth inch, while Egyptian, Peruvian and Brazilian average about one and one-half inches.

Physical Characteristics. Seen under a microscope the individual fiber is seen to be spiral. This twist is found in no other animal or vegetable fiber and makes possible the very fine yarns which can be spun from cotton. Cotton resists the action of alkalis and is not harmed by high temperatures, therefore cotton materials can be easily washed and ironed. Cotton is harmed by strong acids, hence the injury resulting from some processes of dying.

FLAX.

History. Flax was cultivated and linen fabrics used by the ancient Egyptians and Hebrews. Herodotus speaks of the great Egyptian flax trade and microscopic examinations show that mummy cloth is of flax.

In Europe its cultivation is very extensively carried on and the best linens are made in Ireland, France, Holland and Belgium.

An effort was made in 1865 to substitute it for cotton, but since its cultivation and manufacture are essentially different from that of cotton the experiment was a failure. However, the cultivation of flax for fiber is attracting some attention now in Michigan, Wisconsin, Minnesota and Washington.

Cultivation. Flax requires greater labor and care than the production of any other crop and the value of the crop is seriously impaired by the slightest carelessness at any one step. These steps may be briefly summarized as follows:

1. Preparation of soil.
2. Sowing of seed.
3. Weeding.
4. Pulling.
5. Rippling.
6. Retting.
7. Drying.
8. Breaking and Scutching.
9. Heckling.

Varieties. The process of heckling gives the line and tow or long and short staple. Variation in the fineness of fiber depends upon methods of cultivation.

Physical Characteristics. The fibers are longer, greater in diameter than the cotton fiber; also somewhat less pliant, with no twist, giving a smooth appearance. When woven into cloth it is a better conductor of heat than cotton cloth because of these characteristics of the fiber. It bleaches and dyes with difficulty, but like cotton is not harmed by high temperatures and weak alkalies.

WOOL.

History. The use of wool dates back to the earliest time of which we have any record. Sheep raising has preceded civilization in nearly all parts of the world.

The present wool producing countries are South America, Australia and New Zeland, the United States, Russia, Great Britian, France, Spain, South Africa and India.

Characteristics. Wool fiber is distinguished from all others by its scale-like surface, which gives its felting and spinning properties. When looked at under the microscope it appears to be made up of little saw-like teeth, overlapping each other. It is strong, elastic, susceptible of being easily dyed and when woven gives great numbers of air spaces. This makes it a poor conductor of heat from the body. It has a property of absorbing 30% of its weight of water and yet not feel damp to the touch. This property of hydrosopic moisture makes it both a valuable and a dangerous textile for underclothing. Wool is not harmed by weak acids, but is harmed by alkalis and high temperatures.

SILK.

History. The silkworm has been raised in China from the most ancient times. There were stringent laws forbidding the people from sending silkworm eggs out of China, or from telling about the manufacture of silk. Justinian I., who reigned at Constantinople, A. D. 527, tried to bring the silkworm culture into Europe. The Arabs carried it to Spain in the Eighth Century and by the Twelfth Century it became known in many parts of Europe. In the Sixteenth Century it was an important business in France.

Silkworm. The silkworm completes the cycle of its existence in about sixty-five days, the three periods being thirty to forty days in a larval state, fifteen to twenty days in a chrysalis state, eight to twenty days as a moth or perfect insect. The life of the larva is usually divided into four ages, varying according to breeding conditions. The average about as follows:

First age, from birth to first molt, five to six days.

Second age, from first to second molt, four days.

Third age, from second to third molt, four to five days.

Fourth age, from third to fourth molt, five to seven days.

Fifth age, from fourth molt to maturity, seven to twelve days.

The chrysalis state is in some respects a sleep and in others a period of great activity. In the cocoon the silkworm changes from the larvel state to the chrysalis. Wings, antennae, reproductive organs and legs are now developed. When these organs have developed completely the moth comes out of the cocoon.

The cocoon from which the insects have come do not give as good silk as those which have not been opened. In raising cocoons for commerce the chrysalis is killed by steaming. After steaming or baking the cocoons go to the reelers, who throw them into warm, soapy water to dissolve the gum. Four or five filaments are wound together as a single thread on the reels. This is dried, tied into skeins and becomes the raw silk of commerce.

Characteristics. Silk has the property of absorbing considerable moisture without feeling damp. Also of absorbing certain metallic salts, which greatly increases the weight of the fiber, while at the same time weakening it. This process is called "loading" or "weighting" silk. Silk fiber is harmed by alkali. It takes dyes readily and combines well with other fibers, animal and vegetable. Its chief value lies in its beautiful luster and strength. In its pure state it is the strongest of the fibers and material woven with it should have more lasting qualities than any textile material.

BIBLIOGRAPHY.

<i>Title</i>	<i>Author</i>	<i>Publisher</i>
The Worker and the State.....	Arthur D. Dean....	The Century Co.
Industrial Evolution of the United States.....	Carroll D. Wright...	Scribner's Sons
Library of Home Economics, Twelve Volumes.....	Various Authors.....	Am. School of Home Economics, Chicago
Heroes and Martyrs of Invention.....	Towle.....	Lee & Shepard, Boston
A Modern School.....	Paul Harnus.....	McMillen
The Place of Industries in Elementary Education.....	Dopp.....	Rand McNally Company
Education and the Larger Life.....	Henderson.....	
Woman's Part in Primitive Culture.....	Mason.....	Appleton 1907
Home Life in Colonial Days.....	Earle.....	McMillan
The Story of the Cotton Plant.....	Wilkinson.....	
How We Are Clothed.....	Chamberlain.....	McMillan

A Sewing Course.....	Woolman.....	Fernald, 217 W. Utica St., Buf- falo, N. Y.
Elements of the Theory and Practice of Cookery.....	William & Fisher.....	McMillan
The Cost of Living Series.....	Richardson.....	John Wiley & Son, N. Y.
Home and School Sewing.....	Patton.....	Newson & Co., New York

MAGAZINES.

The Journal of Home Economics. Roland Park Branch, Baltimore,
Md.
Domestic Art Review, Teachers College, Columbia University.
Boston Cooking School.
Good Housekeeping.

U. S. DEPARTMENT OF AGRICULTURE.

Farmers' Bulletins.

Free of the Department of Agriculture.

- No. 27 Flax for Seed and Fiber.
- No. 36 Cotton Seed and its Products.
- No. 96 Raising Sheep.
- No. 136 The Angora Goat.
- No. 165 Silk Worm Culture.
- No. 239 The Cotton Seed Industry.
- No. 254 The Hemp Industry in the United States.
- No. 321 Principal Commercial Plant Fiber.

